

Name: _____

<p>1. The curve C has the equation $y = x^2 - x - 12$. The finite region R lies beneath the x-axis and is bounded by the curve C and the x-axis.</p> <p>Find the area of the region R.</p>	<p>$y = x^2 - x - 12 = (x - 4)(x + 3)$, so intersection points for x axis at $(4, 0)$ and $(-3, 0)$</p> <p>Signed area of R is given by $\int_{-3}^4 (x^2 - x - 12) dx = -\frac{343}{6}$</p> <p>And so the area of R is $\frac{343}{6}$</p>
<p>2. Find the coordinates of intersection between the curves $y = x + 2$, $y = 3x^2 - 5x + 2$</p>	<p>$x = 0, y = 2$ or $x = 2, y = 4$</p>
<p>3. The curve C has the equation $y = f(x)$ where $f(x) = x^3 - 4x$.</p> <p>(a) Find the coordinates of the points where C crosses or meets the coordinate axes.</p> <p>(b) Show that the equation of the curve with equation $y = f(x - 2)$ can be written in the form $ax^3 + bx^2 + cx + d$ where a, b, c and d are constants to be found.</p> <p>(c) Sketch the curve with equation $y = f(x - 2)$</p>	<p>(a) $(0, 0), (2, 0), (-2, 0)$</p> <p>(b) $f(x - 2) = (x - 2)^3 - 4(x - 2) = x^3 - 6x^2 + 8x$</p> <p>(c) https://www.desmos.com/calculator/vdamgkxdkd</p>
<p>4. Give a counter-example to the claim that all natural numbers are divisible by some prime.</p>	<p>1 is a natural number but is not divisible by any prime</p>